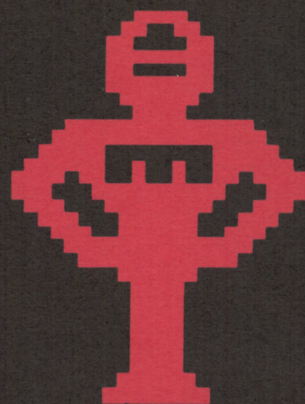


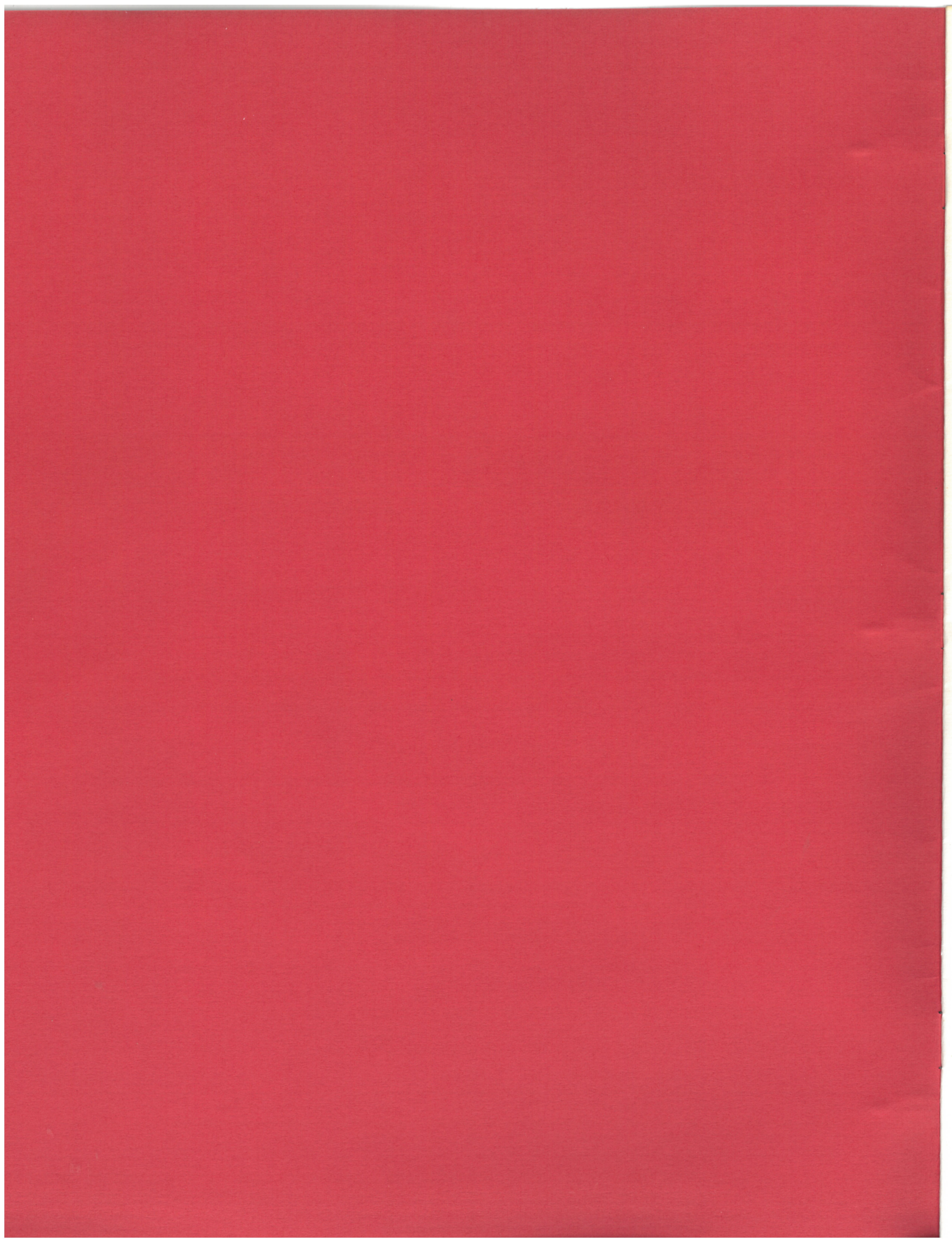
Quadratic Equations

STUDENT WORKBOOK

Elementary Algebra



**Courses
by
Computers, Inc.**



Elementary Algebra

QUADRATIC EQUATIONS

Student Workbook



TM

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Educational Courseware**

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Quadratic Equations

Lesson 1 - Special Cases

Name: _____ Date: _____

Practice Set 1 - Equations of the Form: $ax^2 \pm bx = 0$

Example:

Name the two solutions of this equation.

$$4x^2 - x = 0$$



$$x(4x - 1) = 0$$

$$x = 0 \quad \text{or} \quad 4x - 1 = 0$$
$$4x = 1$$

$$x = 0 \quad \quad \quad x = \frac{1}{4}$$



The solutions are 0 and $\frac{1}{4}$.

Name the two solutions of each equation.

1. $y^2 - 3y = 0$ _____

2. $k^2 + 7k = 0$ _____

3. $d^2 + d = 0$ _____

4. $6b^2 + 3b = 0$ _____

5. $3c^2 - 3c = 0$ _____

6. $4x^2 + 2x = 0$ _____

7. $5p^2 - 10p = 0$ _____

8. $2y^2 - 4y = 0$ _____

9. $5x^2 - 2x = 0$ _____

10. $7b^2 - b = 0$ _____

11. $p^2 + 8p = 0$ _____

12. $3y^2 + y = 0$ _____

13. $8x^2 + 2x = 0$ _____

14. $k^2 - k = 0$ _____

Quadratic Equations

Lesson 1 – Special Cases

Name: _____ Date: _____

Practice Set 2 – Equations of the Form: $x^2 - a^2 = 0$

Example:

Name the two solutions of this equation.

$$\begin{array}{c} x^2 - 4 = 0 \\ \downarrow \\ x^2 - 2^2 = 0 \\ \downarrow \\ (x - 2)(x + 2) = 0 \\ x - 2 = 0 \quad \text{or} \quad x + 2 = 0 \\ x = 2 \qquad \qquad x = -2 \end{array}$$



The solutions are 2 and -2.

Name the two solutions of each equation.

1. $y^2 - 25 = 0$ _____

2. $k^2 - 16 = 0$ _____

3. $b^2 - \frac{1}{4} = 0$ _____

4. $p^2 - 4 = 0$ _____

5. $x^2 - 9 = 0$ _____

6. $b^2 - \frac{1}{9} = 0$ _____

7. $k^2 - 64 = 0$ _____

8. $x^2 - 49 = 0$ _____

9. $y^2 - 36 = 0$ _____

10. $x^2 - \frac{1}{25} = 0$ _____

11. $k^2 - 1 = 0$ _____

12. $p^2 - 81 = 0$ _____

13. $x^2 - 100 = 0$ _____

14. $b^2 - 1 = 0$ _____

15. $k^2 - \frac{1}{64} = 0$ _____

16. $y^2 - \frac{1}{100} = 0$ _____

Quadratic Equations

Lesson 2 – The General Case

Name: _____ Date: _____

Practice Set 1 – Factorable Forms: Two Solutions

Example:

Name the two solutions of this equation.

$$x^2 - 3x + 2 = 0$$



$$(x - 1)(x - 2) = 0$$

$$x - 1 = 0 \quad \text{or} \quad x - 2 = 0$$

$$x = 1$$

$$x = 2$$



The solutions are 1 and 2.

Name the two solutions of each equation.

1. $k^2 + 3k - 4 = 0$ _____

2. $y^2 + 4y + 3 = 0$ _____

3. $b^2 - b - 6 = 0$ _____

4. $p^2 - 7p + 12 = 0$ _____

5. $x^2 - 4x - 12 = 0$ _____

6. $y^2 + 5y + 6 = 0$ _____

7. $k^2 - 6k - 16 = 0$ _____

8. $x^2 - 6x + 8 = 0$ _____

9. $p^2 - 3p = 4$ _____

10. $b^2 - 10 = 3b$ _____

11. $x^2 + x = 20$ _____

12. $y^2 - 14 = 5y$ _____

Quadratic Equations

Lesson 2 – The General Case

Name: _____ Date: _____

Practice Set 2 – Factorable Forms: One Solution

Example:

Name the solution of this equation.

$$\begin{aligned} p^2 - 8p + 16 &= 0 \\ \downarrow \\ (p - 4)(p - 4) &= 0 \\ p - 4 &= 0 \\ p &= 4 \end{aligned}$$



The solution is 4.

Name the solution of each equation.

1. $x^2 + 6x + 9 = 0$ _____

2. $k^2 - 10k + 25 = 0$ _____

3. $4y^2 + 12y + 9 = 0$ _____

4. $d^2 - 18d + 81 = 0$ _____

5. $y^2 - 2y + 1 = 0$ _____

6. $16d^2 + 16d + 4 = 0$ _____

7. $9x^2 - 6x + 1 = 0$ _____

8. $25p^2 + 20p + 4 = 0$ _____

9. $b^2 + 49 = 14b$ _____

10. $k^2 + 16k = -64$ _____

Quadratic Equations

Lesson 3 – The Quadratic Formula

Name: _____ Date: _____

Practice Set 1 – The Quadratic Formula

Rule:

To find the solution of a quadratic equation of the form:

$$ax^2 + bx + c = 0,$$

the quadratic formula can be used:

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Example:



Find the solutions of this equation.

$$x^2 + 5x + 4 = 0$$

$$a = 1 \quad b = 5 \quad c = 4$$

$$x = \frac{-5 \pm \sqrt{25 - 4 \cdot 1 \cdot 4}}{2 \cdot 1}$$

$$x = \frac{-5 + \sqrt{9}}{2}$$

$$x = \frac{-5 - \sqrt{9}}{2}$$

$$x = -1$$

$$x = -4$$

Find the solutions of each equation.

1. $x^2 + 3x - 4 = 0$ _____

2. $3y^2 + 5y + 2 = 0$ _____

3. $k^2 + 4k + 3 = 0$ _____

4. $b^2 - 3b = 0$ _____

5. $5y^2 + 2y = 0$ _____

6. $-9k^2 + 16 = 0$ _____

7. $n^2 + 2n - 15 = 0$ _____

8. $x^2 + 7x + 10 = 0$ _____

9. $b^2 - 7b + 5 = 0$ _____

10. $x^2 + 3x - 1 = 0$ _____

11. $k^2 + 5k + 2 = 0$ _____

12. $3y^2 - 5y - 1 = 0$ _____

13. $c^2 - 3c - 2 = 0$ _____

14. $3b^2 + 5b + 1 = 0$ _____

15. $n^2 + 7n - 3 = 0$ _____

16. $2p^2 - p - 5 = 0$ _____

Personal Record Sheet

Quadratic Equations Objective Mastery Record

Name _____

Shade in the correct box when mastery is achieved for that objective.

1a	1b	2a	2b	3a
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Date Completed

Glossary

Quadratic Equation

Equations in the form

$$ax^2 + bx + c = 0$$

where a , b , and c are constants and $a \neq 0$, are quadratic.
For example, each of the following equations is quadratic:

$$x^2 - 7x + 6 = 0$$

$$3x^2 + x = 0$$

$$5x^2 - 20 = 0$$

Quadratic Formula

A formula for finding the solution(s) of a quadratic equation is a quadratic formula. For example, the solutions for:

$$ax^2 + bx + c = 0$$

are equal to:

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

